CHAPTER 5
CUMULATIVE IMPACTS

Cumulative impacts are defined as impacts on the environment which results from the incremental impact of the action (refer to Chapters 3 and 4) when added to other past, present, and reasonably foreseeable future actions. According to the Chittenden County Regional Planning Commission, developments in the County over the next 4 to 5 years are expected to consist mainly of shopping centers and some minor restoration in the City of Burlington (Hogan, 1995). In addition, some roadway improvements will be made which will include reconstructing Riverside Avenue, the main road for truck traffic to the McNeil Station. Two wood chip burning power plants have also been evaluated to determine regional and area-wide effects to wood chip resources.

5.1 AIR QUALITY

The proposed project would not violate Vermont APCD air quality significance criteria/standards for criteria air pollutants or air toxic emissions (refer to Chapter 4 and Appendices). While the proposed action would incrementally add air emission to the local air shed, as defined by the State APCD, project operations would not significantly contribute to the degradation or deterioration of air resources. Based on the expected air emissions from the other related projects, adverse cumulative air quality impacts would not be expected.

5.2 WATER RESOURCES AND WATER QUALITY

As stated in Section 4.1.2, the additional water usage for Phase II and II would be a small incremental increase in process water. The capacity of the four wells servicing the McNeil Station would have ample capacity to support both phases of the proposed action. Therefore, no new wells would be needed and no new demand would be placed on the water supply.

Most of the additional process water required would be a small increase in what is currently being used (e.g., cooling water) Therefore, no appreciable changes in filtration, chemical treatment, or discharge are expected. Water used for gas cleansing operations may require some additional treatment prior to discharge as described in Sections 3.2.3 and 4.1.2.2, but would be required to comply with a State-approved NPDES permit. Therefore, no cumulative impacts to water resources or water quality are expected.

5.3 NATURAL RESOURCES

The type and quality of wood used for power generation is generally unacceptable for other uses (wooden-ware, lumber) and, therefore, doesn't compete with wood used for lumber. Regarding availability of wood chip resources, two wood-burning electric plants have become operational since the McNeil Station came on-line. According to the VDFPR the amount of wood required for phase II of the proposed action and these power plants would not adversely impact the wood chip supply in the project region.

5.4 NOISE

The proposed project is not expected to increase existing noise levels within the project area. Operation of the other related actions (commercial development and public infrastructure improvements) would not effect the same noise-sensitive receptors simultaneously. Therefore, no cumulative noise impacts would be expected.

5.5 SOCIOECONOMICS

The proposed project would not effect the socioeconomic setting in the project area. Based on the magnitude and type of other activities in the area, impacts to the local socioeconomic setting is not expected. No cumulative socioeconomic impacts would be expected with implementation of the proposed project.

While no increase in the facility's operational workforce is anticipated, an estimated 16 temporary workers would be employed during the expected 10 month construction period for the proposed gasifier. The full labor complement could be supplied from the Burlington area, depending on the availability of appropriate labor skills. This relatively small, temporary workforce would be minor compared to labor required for the planned commercial developments, and would not result in impacts to population, housing, or community services.

5.6 TRANSPORTATION

According to authorities in the Cities of Burlington and Winooski, and Chittenden County, the addition of 3 trucks per day during Phase III is not expected to adversely impact traffic conditions in the area. Based on the magnitude of other future projects in the project area and future roadway improvements, the small incremental increase in truck traffic would not change the service level on any of the roads used to transport wood chips. No cumulative transportation impacts would be expected with implementation of the proposed project.

CHAPTER 6

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APPENDIX A

CERTIFICATE OF PUBLIC GOOD
AND
ASSOCIATED WOOD HARVESTING DOCUMENTS

APPENDIX B

RESOURCE AGENCY LETTERS IN SUPPORT OF PHASE II

APPENDIX C

AIR QUALITY TECHNICAL SUPPORT DOCUMENTATION

(air pollution application/permit for the
Proposed Phase II is available under seperate cover from DOE/GOL)

APPENDIX C

AIR QUALITY TECHNICAL SUPPORT DOCUMENTATION

Gas Combustion Turbine

Criteria Pollutants

Maximum Daily Emissions:

$$Emissions\left(\frac{lbs}{day}\right) = E.F. \times \left(\frac{76\ MMBtu}{hour}\right) \times \left(\frac{24\ hours}{day}\right)$$

Where:

E.F. = Emission factor from EPA AP-42, "Compilation of Air Pollutant Emission Factors, Volume I, Supplement F", lbs/MMBtu.

76 MMBtu/hr = Assumed maximum heat input for the gas combustion turbine

Annual Emissions:

$$Emission\left(\frac{tons}{year}\right) = \left(\frac{lbs}{day}\right) \times \left(\frac{365\ days}{year}\right) \times \left(\frac{ton}{2000\ lbs}\right) \times 0.9$$

Where:

0.9 = The availability factor of the gasification system to produce gas.

Air Toxic Pollutants

Particulate Pollutants:

$$Emissions \left(\frac{lbs}{8\ hrs}\right) = E.F. \times \left(\frac{200\ tons\ wood}{day}\right) \times \left(\frac{day}{24\ hrs}\right) \times \left(\frac{8\ hrs}{8\ hr\ period}\right)$$

Where:

E.F. = Emission factor from AWMA "Air Pollution Engineering Manual" for Industrial Wood-Fired Boilers, lbs/tons of wood burned.

(200 tons wood)/day = Maximum daily throughput of wood burned to produce gas.

8 hrs/8 hr period = averaging period for significance

$$Emissions \left(\frac{lbs}{8\ hrs}\right) = E.F. \times (169812\ DSCFH) \times \left(\frac{8\ hrs}{8\ hr\ period}\right)$$

Where:

E.F. = Emission factor from State of Vermont "Wood-Fired Boiler Particulate Matter Emissions Compliance Program and Multiple Metal Emissions Evaluation Program, State Office complex, Waterbury, Vermont, Final Report", April 26, 1994

(169812 DSCFH) = Hourly design throughput of product gas in dry standard cubic feet.

8 hrs/8 hr period = averaging period for significance

Gaseous Pollutants:

$$Emissions \left(\frac{lbs}{8\ hrs}\right) = E.F. \times \left(\frac{1.35\ MMft^3}{hr}\right) \times \left(\frac{8\ hrs}{8\ hr\ period}\right)$$

Where:

E.F. = Emission factor from SCAQMD "Approved Air Toxic Emission Factors for Natural Gas Combustion", lbs/MMft^3.

1.35 MMft^3/hr = Assumed maximum heat input.

8 hrs/8 hr period = averaging period for significance

Annual Emissions:

Annual air toxic emissions were calculated in a similar fashion for operation of 7884 hours per year.

Emission Calculation Spreadsheets

Screening Air Dispersion Modeling Results

APPENDIX D

ENVIRONMENTAL TECHNICAL REPORTS

D-1 Air Quality

D-2 Natural Resources

D-3 Socioeconomics

D-4 Transportation

APPENDIX D-1

AFFECTED ENVIRONMENT

This section summarizes the existing climate and air quality setting for the proposed project area.

There is no specific climate classification for the project region. The climate of Burlington Vermont, like the majority of New England it is characterized by:

- Variation of weather
- Large range of temperature, both daily and annual
- Great differences between the same seasons in different years
- Equable distribution of precipitation
- Considerable diversity from place to place.

The regional climatic influences are modified by varying elevations, types of terrain and distances from the Atlantic Ocean and Lake Champlain. The state has also been divided into three climatological divisions: western, northeastern, and southeastern. The City of Burlington is located in the western division, on the eastern shore of Lake Champlain. The western division is least affected by Atlantic Ocean influences. The annual mean temperature for the western division is 78E Celsius (46E Fahrenheit), the total annual precipitation is nearly 97 cm (38 inches), and the annual total snowfall is 140 to 165 cm (55 to 65 inches).

The terrain of Vermont is hilly to mountainous. The Connecticut River forms the entire eastern border of the state and Lake Champlain forms over 185 km (100 miles) of the western boundary. Although much of the state has elevations ranging from 152 to 610 meters [500 to 2,000 feet (feet)], elevations of less than 152 meters (500 feet) are in the lowlands that parallel Lake Champlain in the western division. The Green Mountains extend the length of the state and rise to their highest elevation at Mt. Mansfield, 1,339 meters (4,393 feet) above sea level (asl), approximately 32 km (20 miles) east of Burlington.

Vermont lies in the "prevailing westerlies," the belt of generally eastward air movement which encircles the globe in middle latitudes. Extensive air masses originating in higher or lower latitudes can mix and interact to produce low pressure storm systems which pass over or near Vermont. The majority of air masses that affect the western division are two types: cold, dry air from subarctic North America, and warm, moist air streaming up from the Gulf of Mexico and other subtropical waters.

The procession of contrasting air masses and the relatively frequent passage of "lows" bring an average of twice a week alternation from fair to cloudy or stormy conditions attended by abrupt changes in temperature, moisture, sunshine, and wind direction and speed, with no regular pattern. A graphical representation of the annual frequencies of wind speed and direction observated at the Burlington International Airport during 1992 is shown in Figure D1-1.

This subsection briefly describes the criteria air pollutants which are of concern for air quality regulators. These pollutants are termed criteria pollutants because federal and state laws have established criteria of comparison for each pollutant. These criteria, or ambient air quality standards (AAQS), are expressed as threshold concentrations or parameters which are considered the minimum necessary for good air quality. The project region currently experiences relatively good air quality since none of these criteria are exceeded, therefore, the region in attained the AAQS.

Since the assessment of potential project impacts are discussed in relationship to the predicted emissions of the air contaminants. A summary of the primary criteria air pollutants follows for reference.

Carbon Monoxide: CO is a colorless, odorless gas. Human-caused sources of CO result from the incomplete combustion of organic compounds from various combustion sources, such as residential wood stoves, agricultural burning, or fossil fuel. CO from motor vehicle exhaust can be of particular concern in urban areas where the pollutant is

concentrated by large numbers of idling vehicles. The highest concentrations of CO are usually observed during the early morning rush hour on colder winter mornings along heavily used urban transportation corridors or intersections. CO is currently not a serious problem in the project region because the AAQS is not exceeded.

Particulate Matter: Particulate matter suspended in the air is a criteria pollutant. Particles which are less than 10 micron in diameter are referred to as PM_{10}. They are of particular concern because PM_{10} are small enough to be inhaled deep into the lung. Some of the typical fugitive sources of PM_{10} are construction and earth moving activities such as surface grading, vehicle travel on paved and unpaved roads, industrial processes, and combustion, particularly of fossil fuels. The project area is in attainment of the PM_{10} AAQS.

Nitrogen Oxides: Nitrogen Oxides (NO_X) is a term used to describe composite atmospheric concentrations of nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless compound, whereas NO_2 appears reddish in color. NO_X are typically emitted largely as NO during high temperature combustion processes and subsequently oxidized to NO_2 in the

Figure D1-1

atmosphere. NO concentrations in urban areas typically peak during the early morning hours due to combustion from automobile traffic. The presence of NO_2 in the atmosphere is considered to be a precursor to forming ozone. NO_2 concentrations within the project area are not currently a concern due to the good dispersion and lack of severe transportation problems.

Sulfur Dioxide: Sulfur dioxide (SO_2) is a colorless gas under normal conditions at the earth's surface. Most human-caused SO_2 comes from the burning of fossil fuels, mostly coal, in power plants. SO_2 is subject to long range transport and is the major component of acid rain. Ambient concentrations of SO_2 are currently well below the AAQS, therefore, this pollutant is not considered a significant problem for the regional air quality.

Hydrocarbons: Hydrocarbons are compounds composed of hydrogen and carbon. Some of these compounds are classified as reactive such as volatile organic compounds (VOC), or reactive organic compounds ROCs. These compounds react in the presence of sunlight with NO_x compounds to form ozone. The most predominant anthropogenic source of hydrocarbon emissions is the operation of motor vehicles.

Ambient air quality is primarily a result of the type and amount of pollutants emitted into the atmosphere, the meteorological conditions which disperse these emissions, and the size and topography of the region. AAQS have been developed by the federal government to establish levels of air quality which, when exceeded, may cause adverse human health effects. Air quality is generally considered acceptable if pollutant levels are less than or equal to the AAQS on a continuous basis. The State of Vermont does not have AAQS; they refer to the federal AAQS.

The proposed project is within the jurisdiction of the Vermont Agency of Natural Resources, Environmental Conservation Department, APCD. Both the U.S. Environmental Protection Agency (EPA) and the APCD have established, and are responsible for, attaining and maintaining the

AAQS. The status of attainment of AAQS for all pollutants is tracked to ensure that health standards are being met. The area around Burlington is in attainment status for the federal AAQS for all criteria pollutants.

The EPA promulgated federal AAQS, as defined in Section 3.1.2.2, under the provisions of the Federal CAA. In addition, the CAA with the 1990 amendments is divided into 11 Titles, the first five are potentially most relevant to the proposed project. Title I deals with the attainment and maintenance of the AAQS. It defines various levels of attainment for each type of criteria pollutant and requires levels of control technology depending on the severity of nonattainment. Implementation of Title I is delegated to the State of Vermont. Written operating permits and BACT requirements are examples of the implementation of Title I.

Title II refers to mobile sources. The authority to implement Title II is given to the Vermont Agency of Natural Resources. The same is true of Title III which deals with hazardous air pollutants. Title III lists 189 hazardous air pollutants which are incorporated into the Vermont list of Hazardous Air Contaminants. Maximum Achievable Control Technology (MACT) is required for identified categories and subcategories of sources. The CAA requires the EPA to promulgate regulations establishing MACT emission standards for each category and subcategory of major sources of listed hazardous air pollutants. Implementation schedule for establishing the MACT standards required 25 percent of the categories to be issued by November 15, 1994, and requires an additional 25 percent by November 15, 1997, and all categories by November 15, 2000. Permitting, risk assessment, and accidental release prevention are also addressed in Title III and implemented by the state agency. Title IV deals with acid rain and control of major sources of SO_x and NO_x.

Title V of the CAA involves establishing Federal Operating Permits which encompass and supplement state air permitting programs. The main components of the Federal Operating Permit program are that for affected Major Sources, an entire facility is permitted for a maximum 5 years and that these permits are subject to public, neighboring states, and EPA review. Any significant modifications to the facility triggers the modification of the permit and additional review.

In general, federal actions must conform to the requirements of State Implementation Plans promulgated pursuant to the CAA. Document 40 U.S.C. 7401 et. seq. specifies procedures applicable to the determination of conformity.

The State of Vermont has a separate set of air quality regulations administered by the APCD, which apply to projects within the state. The APCD is primarily responsible for regulating all stationary and nonvehicular sources.

Subchapter V, Section 5-501, "Review of Construction or Modification of Air Contaminant Sources," requires that a new or modified source obtain written authorization from the Secretary of the Agency of Natural Resources. This regulation includes permitting and emission control requirements for both new or modified major sources and non-major sources of air contaminants. Requirements include:

- Submission of plans
- Specifications
- Analyses
- Visibility impact analyses
- Public notification procedures.

Subchapter I, Section (48) of the APCD regulations defines a Major Stationary Source of air emission as any stationary source or modification whose allowable emissions of any air contaminant are equal to or greater than 50 tons per year. Subchapter I, Section (77) of the APCD regulations defines a significant source as a new or modified

source with emissions increases that equals or exceeds a maximum threshold for any criteria pollutant. The limits established by this section for each category of pollutant are:

Pollutant	Tons per Year
PM_{10}	15
CO	50
NO_X	40
VOC	40
SO_2	40

These limits or thresholds will serve as the primary criteria for determining the significance of the air emissions for the proposed project.

APPENDIX D-2

NATURAL RESOURCES

Based on data published by the U.S. Forest Service (USFS), 50 percent of Vermont's forest inventory is wood that has no potential for manufacturing quality products such as wooden ware or furniture. This unusable wood consists largely of poorly-formed trees and tree tops left behind after trees have been conventionally harvested as sawlogs or pulpwood. The amount of wood available for whole tree chip harvesting has been conservatively estimated at one million wet (commonly referred to as green tons) tons per year in Northern Vermont alone. There is approximately 1 dry ton for every 2 wet tons of wood.

Harvested by various contractors approved by BED, woodchips may be obtained from any forestland where low-quality trees are found. The majority of these woodlands are privately owned. Approximately 80 percent of the woodchips that fuel the McNeil Station are called whole tree chips and come from low-quality trees and harvest residues which are cut and chipped in the forest. The chips are then transported by trailer truck to the Station or to a railcar loading site in Swanton, Vermont (approximately 40 miles north of Burlington). The remaining 20 percent of McNeil's wood requirements are met by purchasing residues such as chips and bark from local sawmills (BED [no date]).

Silvicultural and wood harvesting concerns were extensively addressed during the hearings to obtain the Certificate of Public Good. (The requirements of the Certificate of Public Good, BED's "Harvesting Policy for Whole Tree Chipping Operations in Vermont", regulations for chip harvest operation, "Policy for Employees Monitoring Chip Harvester Operations", a "Report of Chip Harvester Operations in Vermont", and a "Chip Harvester Monitoring Inspection Summary - 1986" are included with this EA as Appendix A). The rules created as part of BED's Certificate of Public Good are briefly summarized as follows:

- Agreements between BED and wood chip suppliers should be in writing and in accordance with the Vermont Department of Fish and Wildlife (VDFW)

- For each proposed harvesting location, BED should provide to the VDFW's wildlife habitat biologist for approval: a map which shows, in addition to the location of operations, information regarding the nature of the harvest (including harvest acreage and description), the approximate dates during which operations would be conducted, and the name and address of the prospective operator

- Harvesting operations would be monitored by certified foresters

- BED would maintain records of its wood chip suppliers, to be compiled into an annual report to the VPSB, the Department of Public Service, and the State of Vermont Agency of Natural Resources. (VDFPR, 1987)

The McNeil Station is designed and permitted to handle 500,000 green tons of wood chips per year, half of what has been conservatively estimated by the USFS to be available to wood chip consumers. However, on average the McNeil Station has been using approximately 160,000 green tons a year, based on operational data collected over the last nine years. (BED, 1995). The amount of wood used is dependent upon the operating conditions of the Station. To run the station at full-load, the consumption of wholetree chips is approximately 76 tons per hour. Based on approximately 2.5 tons of wood chips per cord of green wood, the Station has the ability to burn approximately 30 cords per hour (BED [no date]).

According to the Vermont Department of Forests, Parks, and Recreation (VDFPR), "In producing electricity through the use of wood-fired plants, the challenge is to ensure that harvesting of wood fuel is carried out in a manner which has a positive impact on the forest - encouraging wood harvesters to not only avoid making the forests less

healthy, but to conduct their operations in such fashion that the vitality for our forests is actually improved." Originally, VDFPR monitored 100 percent of BED's harvesting activities. This was later reduced to 30 percent, and is now done only on occasion. So satisfied was the VDFPR with its findings, it concluded "...the dual goals of producing electric energy through the use of wood and maintaining Vermont's forests in a healthy state are being achieved" (VDFPR, 1987).

The fuel for the proposed project would be wood chips, identical to that which is presently utilized at the McNeil Station. During Phase I of the proposed project, any amount of wood combusted in the gasifier will displace an equal amount of wood that otherwise would be combusted in the McNeil Station boiler. Since there would be no additional woodchip usage during Phase I, no adverse impacts are expected.

Estimates prepared for the proposed project indicate that if Phase II of the project (the gas turbine generator) is implemented, a maximum of an additional 80,000 tons of green wood chips per year would be required (BED, 1995). Resource demand analyses prepared for the existing McNeil Station were based on the use of 500,000 green tons of wood chips per year. However, the facility's use has averaged 160,000 green tons per year over the last nine years (BED, 1995). The additional 80,000 tons - when added to the 160,000 tons typically used - would be approximately 240,000 tons. This is still less than half the basis for the previous impact analysis, and well within range of use analyzed for the McNeil Station. The VDFPR was consulted to identify additional demands made on local woodchip resources since the original analysis. The VDFPR indicated that since the analysis for the McNeil Station was prepared, two additional woodchip-burning electric power plants have come on-line. However, according to VDFPR, even with the demands from the plants, and the maximum additional woodchip demand from Phase II of the proposed action, an adequate supply of woodchip resource would be available for existing and future demands. Therefore, an additional 80,000 ton woodchip demand during Phase II would not have an adverse effect on woodchip resources.

APPENDIX D-3
SOCIOECONOMICS

The following section was prepared in response to Executive Order (E.O.) 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." E.O. 12898 requires Federal agencies to identify and address environmental effects of their projects on minority and low-income populations. The approach taken in this EA is intended to identify potential effects from project-related activities on areas of minority or low-income populations.

Socioeconomic issues which are relevant to the proposed action are effects to the existing social and economic conditions in Chittenden County and the City of Burlington. The following subjects are addressed: economy, population, and housing. This section also includes information on the local fire protection services.

Chittenden County is part of a four-county area that comprises the Northwest region of Vermont, and contains the only metropolitan area in the state, half of Vermont's 24 largest cities and towns, and more than one third of the state's residents (Vermont Dept. of Employment and Training (a), 1994).

The Northwest region has 40 percent of all jobs in Vermont, and contains 44 percent of all manufacturing jobs in the state, with most of these jobs in high tech and defense industries. Half of the jobs in Vermont's trade and service industries also are in the Northwest region. Chittenden County employment for 1992 was 76,188, which is approximately 31 percent of the total workforce in the State of Vermont. The strength of the Chittenden County economy is reflected in its low unemployment levels. During the period 1988 to 1993, the Burlington Labor Market Area had the lowest unemployment rate among 21 New England labor market areas. (Vermont Dept. of Employment and Training (a), 1994)

The annual per capita income for Chittenden County in 1991 was $20,661, which is approximately 15 percent higher than the Vermont state average, while the county's annual wage in 1992 was $25,917, approximately 16 percent higher than that for the state. According to the 1990 Census, the City of Burlington's median household income is $25,523, as compared to $36,877 in Chittenden County and $29,792 statewide. (Mt. Auburn Associates (a), 1994).

Nearly 20 percent of the Burlington city residents live in poverty, a percentage that is more than double that of Chittenden County and significantly higher than the state. The problem is even more severe in specific parts of the city. In the Old North End of Burlington, in the vicinity of the proposed project, almost a third of residents live in poverty. Approximately 42 percent of children in this neighborhood fall below the poverty line. [The U.S Census Bureau has determined the poverty level to be $12,674 for a four person family in 1989 - the date of figures used in preparation of the 1994 Mt. Auburn Associates report (Dillon, 1995). This neighborhood has the highest concentrations of poverty in the entire state (Mt. Auburn Associates (a) and (b), 1994).

To characterize the economic profile of the population nearest the McNeil Station, Census Tract 3, Block Group 1 was referenced. Mean earnings per household were approximately $24,673 per year, placing 27.9 percent of households below the poverty level.* According to the Community and Economic Development Office (CEDO), this is the largest concentration of low income residents in the state, and among the three or four locations in Vermont with poverty levels approaching 30 percent (Dillon, 1995).

Chittenden County is Vermont's most populous county, with a 1992 population of 133,422, which represents 23 percent of the total population for the State of Vermont. The 38,518 residents of Burlington make it the largest city in Vermont.

The U.S. Census Bureau has determined the poverty level of the City of Burlington to be $12,674 for a four person family in 1989 - the date of figures used in preparation of the 1994 Mt. Auburn Associates report (Dillon, 1995).

In 1990, Burlington's population was almost 97 percent white, which is comparable to the state overall. However, during the 1980s, Burlington did experience, on a small scale, an influx of minorities. While the actual number of minority people settling in Burlington is relatively small, the total increase in population during the 1980s was slightly over 1,400, meaning that 60 percent of new Burlington inhabitants were minorities (Mt. Auburn Associates (a), 1994).

For this analysis, the City of Burlington CEDO was consulted. To characterize the population nearest the McNeil Station, Census Tract 3, Block Group 1 was referenced.

In 1989, there were approximately 3,390 persons in Census Tract 3. These persons described themselves as follows:

- 3,232 White
- 54 Black
- 54 Asian
- 23 Hispanic
- 19 American Indian
- 8 Other

Thus, while minorities are represented in the area, with Asians as the fastest growing group, the area would not be designated as a "minority community."

It is expected that the minority population in the City of Burlington would continue to expand rapidly. The Vermont Refugee Resettlement Program has announced plans to bring approximately 1,200 Asian refugees to the city over the next 5 years, a move that would triple the number of current Asian residents. Almost 500 refugees have already been resettled in the city between 1989 and 1993, a significant number in Burlington's Old North End (Mt. Auburn Associates (a), 1994).

The median price of homes in the Burlington area is $99,800. That is less than the median countywide ($112,900) but 106 percent of the statewide figure. However, the Burlington market area is primarily a

rental market: 60 percent of households are renters, and 40 percent are homeowners. This is compared to 65 percent owner occupied/35 percent renter occupied housing in Chittenden County, and 69 percent owner occupied/31 percent renter occupied in the state (Vermont Dept. of Housing and Community Affairs, 1994).

Due to wood chip storage practices, the McNeil Station had a problem with both odors from decomposing chips, and recurring wood chip fires in its early operation (about 1985). However, the McNeil Station staff developed a wood storage plan for the facility in association with the fire marshall's office, quickly resolving the problems. The McNeil Station staff maintain a working relationship with the fire marshall's office, providing tours of the facility for fire response personnel (Marcus, 1995).

According to the fire marshall's office, the existing McNeil Station does not create a higher-than-normal burden for the local emergency services providers. According to McNeil Station personnel, fire protection capability is also supplemented with onsite fire fighting equipment.

This section describes potential impacts to the socioeconomic setting and local fire protection services. The effects of the proposed project relative to E.O. 12898 is also discussed in the following section.

It is anticipated that an average of 16 workers would be employed during construction of Phase I. Based on preference of construction contracts being given to locally based companies, the project is not expected to generate a major influx of new employees. Since the construction labor force would not represent a large increase in the permanent or visitor population to the Burlington area, adverse impacts to the socioeconomic setting is not expected.

The test program for the gasifier is anticipated to last for approximately 10 months. While no increase in the facility's operational workforce is anticipated, there will be a large number of

consultants, visitors, and technicians visiting the plant in this time frame. Local hotels, restaurants, and car rental agencies could realize increased business activity as a result. While the proposed project may be a beneficial economic impact, it would not be a significant economic growth factor. However, no adverse financial impact on the local economy is anticipated in funding the project.

The fire marshall has indicated that the proposed project (Phase I or II) would not create any additional demand to the existing fire protection service. Based on the local fire fighting resources ability to serve the proposed project. Adverse impacts to fire protection services are not anticipated.

As discussed in section 3.5.1, the nearest population to the proposed project is not predominantly comprised of minority or disadvantaged groups. Consequently, the proposed project would not be expected to result in unfair or unequal treatment of any minority sector of the project area. Based on available socioeconomic data, this population is below the poverty level. However, as discussed throughout Chapter 4, no adverse environmental or social impacts would be expected with implementation of Phase I or Phase II of the proposed project. Consequently, the proposed project would not be expected to result in unfair or unequal treatment of any low-income or impoverished communities or populations. The new job opportunities associated with the proposed project could provide low-income groups with employment depending on availability of appropriate labor skills.

The proposed project would not effect the socioeconomic setting in the project area. Based on the magnitude and type of other activities in the area, impacts to the local socioeconomic setting is not expected. No cumulative socioeconomic impacts would be expected with implementation of the proposed project.

While no increase in the facility's operational workforce is anticipated, an estimated 16 temporary workers would be employed during the expected 10 month construction period for the proposed gasifier. The full labor complement could be supplied from the Burlington area,

depending on the availability of appropriate labor skills. This relatively small, temporary workforce would be minor compared to labor required for the planned commercial developments, and would not result in impacts to population, housing, or community services.

APPENDIX D-4

TRANSPORTATION

This section discusses wood chip deliveries to the McNeil station and the transportation conditions on routes through the Cities of Burlington and Winooski that are normally travelled by project-related delivery trucks.

The McNeil Station routinely receives wood chip deliveries by rail and truck. As specified in the original Certificate of Public Good, 75 percent of the wood chip deliveries are transported by rail, the remaining 25 percent is delivered by truck. This limitation was placed in an effort to reduce the amount of traffic congestion in the City of Winooski's city streets and historic districts. Shipments by truck and rail are also limited in the time they may deliver fuel. The Certificate of Public Good prohibits trucks from utilizing streets or highways within the Cities of Burlington or Winooski on Sundays or before 6:30 a.m or after 9:30 p.m. on any other day.

Before the McNeil Station was built and because of concern regarding increased traffic from fuel trucks in Winooski, the proponents of the McNeil Station sponsored a traffic study to forecast and evaluate impacts to local routes. The study used conservative estimates so that the net result of the assumptions exaggerated the consequences of the activity. It assumed the Station would be operating at full capacity (500,000 tons per year) and all fuel shipments would be made by truck. Based on these assumptions not more than 20 trucks would be arriving or departing the McNeil Station each delivery day. Furthermore, truck traffic to the McNeil Station would not constitute more than 1 percent of the increase in traffic expected from all sources by the year 2000, and that this increase would not cause a significant level of congestion at any major intersection (Certificate of Public Good Petition).

Truck deliveries generally travel Interstate 89 to Exit 15 or 16 and use East Allen Street or Main Street, respectively, to Riverside Avenue. The trucks then travel east on Riverside Avenue to Intervale

Road where the McNeil Station is located. (Figure 2-2). Average Daily Traffic (ADT), defined as the total number of cars passing over a segment of roadway, in both directions, on a typical day, have been recorded on Main Street in Winooski just south of the intersection of Main and East Allen and just north of where Main Street intersects Riverside Avenue. In 1993 the ADT for this location was 29,130. An ADT of 17,550 was also recorded in 1993 on Riverside Avenue west of Intervale Road. While traffic data is available for other connecting road segments, the sections evaluated in this assessment are most relevant to evaluate potential traffic impacts from the proposed project.

Traffic flows on these roads are periodically monitored to determine the roads' Level of Service (LOS). The LOS is a qualitative measure that refers to the different operating conditions that occur in a lane or roadway when accommodating various traffic volumes. It includes traffic flow factors such as special travel time, interruptions, freedom to maneuver, driver comfort, and convenience. LOS is described by a letter rating system from A to F, with LOS A indicating stable flow and little or no delays, and LOS F indicating jammed conditions and excessive delays. East Allen Street and Main Street in Winooski generally have a B LOS during non-peak hours and may reach an E LOS during peak evening hours. Riverside Avenue generally has a B LOS.

Based on operational data collected over the last 10 years, the McNeil Station's wood chip consumption is averaging approximately 160,000 tons per year. Assuming a delivery ratio of 75:25 for rail and truck, respectively, approximately six trucks per day are used to transport wood chips to the McNeil Station. According to local authorities in both Burlington and Winooski, the small number trucks delivering wood chips to the McNeil Station are virtually indiscernible. Data for daily rail shipments was not available, however approximately 95 rail shipments are made annually depending upon energy demand.

For the purposes of this EA, changes in traffic volume were evaluated for both Phase I and Phase II. Phase I would involve constructing and

operating the gasifier, and using the product gas to power the existing McNeil Station boiler. During Phase I, each ton of wood that is utilized in the gasifier would displace a ton of wood that would otherwise go to the main boiler. Since there would be no net change in fuel consumption, no additional fuel would be transported by truck or rail. However, during gasifier construction an estimated 20 trucks would be required to transport construction material to the site. This is expected to occur over a 2-month period (Narrative for Act 248 Use). Based on the small amount of vehicle trips and the duration of construction, impacts to existing roadway capacity would not be expected.

In Phase II, a gas combustion turbine would be installed to accept the product gas from the gasifier and produce additional electricity. During this phase, up to 80,000 tons of wood fuel could be required in addition to fuel used for the boiler because the gasifier, turbine, and boiler would be operating simultaneously. Based on the most conservative scenario of 80,000 tons per year, traffic to the McNeil Station would increase by approximately 3 trucks per day and 40 trains per year (approximately 1 every 9 days).

The original Certificate of Public Good expressed a concern only for truck traffic and concluded that 20 trucks per day would not result in any adverse impacts to traffic conditions in Winooski. Since the McNeil Station has been on line it has been operating at roughly 37 percent of capacity, with a corresponding traffic burden of only a fraction of what was allowed. From Phase II, the 3 additional trucks per day would bring the total fuel truck traffic to 9 vehicles per day. This number is less than half of what was originally allowed. Based on the allowances in the Certificate of Public Good, Phase II of the demonstration project is well within the predicted and accepted limit for truck transport and, therefore, would not have an adverse impact on traffic conditions in and around the Cities of Burlington and Winooski.